NAS Jacksonville Achieves Zero Wastewater Discharge

First Area Utility to Avoid Discharge into St. John's River

ON OCTOBER 15, 2015 Naval Air Station (NAS) Jacksonville became the first major utility in Northeast Florida to achieve zero discharge to the St. Johns River. The occasion was marked by a ribbon cutting attended by state, local, and Navy officials.

Not only has reuse of treated wastewater eliminated discharge into the river, it has also prevented the withdrawal of 73 million gallons of groundwater from the Floridan Aquifer every year—saving $200,000 in annual fees for potable water—and has reduced the use of fertilizer on base grounds.

A History of Wastewater Reuse

NAS Jacksonville has a long history of reusing treated wastewater instead of discharging it to the St. Johns River. It all began in the late 1990s when the air station leadership agreed to divert thousands of gallons per day of treated wastewater to the nearby Timucuana Country Club to irrigate its golf course. Representatives of the country club and NAS Jacksonville saw the opportunity to develop a tremendous environmental partnership that would benefit the river, groundwater, and the long term operations of the golf course. In 1998, the station and club signed an agreement for the club to connect to the station's dechlorination system and divert approximately 200,000 gallons a day to irrigate its golf course. The country club paid all costs for the design, permitting and construction of the reuse pipeline and retention pond, in exchange for receiving the water at no cost.

Bolstered by this success, NAS Jacksonville applied for a Florida Depart-

The zero discharge ribbon cutting ceremony was hosted by NAS Jacksonville Commanding Officer Capt. Howard Wanamaker (center) and attended by (from left): Jacksonville Mayor Lenny Curry, U.S. Representative Ander Crenshaw, Deputy Assistant Secretary of the Navy for Safety Paul Hanley, Commander Navy Region Southeast Rear Admiral Mary Jackson, St. Johns River Water Management District Governing Board Chairman John Miklos, and Florida Department of Environmental Protection Assistant Secretary Paula Cobb.

Clark Pierce

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U.S. Representative Ander Crenshaw (R-FL) (left) expressed his admiration for the zero discharge wastewater reuse project to former NAS Jacksonville Environmental Director Kevin Gartland (right). Gartland provided more than 15 years of leadership on the project.
Clark Pierce

ment of Environmental Protection permit to expand its wastewater reuse system to its own 27-hole golf course and spray fields. The permit was received in 2004, and in 2007, NAS Jacksonville assisted the City of Jacksonville in obtaining a $175,000 grant from the state to design the expansion. In 2010, the air station obtained a $1.8 million Navy energy conservation grant for phased construction of a portion of the expansion.

In 2011, the station prepared another application for the City of Jacksonville to obtain a $1.8 million matching grant from the St. Johns River Water Management District to construct the remainder of the reuse system expansion. The station completed its portion of the project with a two-mile, direct-bore purple pipe to a 10-acre reuse pond next to the NAS Jacksonville Golf Club in 2012. (Purple is the universal color for non-potable water in the state of Florida.) The city used a $1.4 million district grant in 2014 to complete the final phase of the project to construct a two-mile pipeline and spray fields in the air station's South Antenna Farm area. The spray fields were designed as a method for distributing any wastewater not used by the golf courses with the benefit of irrigating this 47-acre expanse of unused land located between communication antennas. The spray fields are operated manually, and zones are rotated so as not to oversaturate any one particular area.

Once this final phase was complete, the air station reached its goal of zero discharge of all treated wastewater into the St. Johns River.

In early October 2015, the City of Jacksonville completed construction of two more miles of purple pipe to the spray fields at the southern area of the air station. This provided nutrient-rich water to nourish and enhance this part of the base. On October 15, 2015 a symbolic valve was finally shut, signaling the end of discharge into the river.

Smart Landscaping

The station has also worked hard to conserve water through xeriscaping, or the selection of plants that require little or no supplemental watering once established. Native plants clean stormwater by removing dissolved nutrients that could otherwise contaminate the river. "All of our major construction projects use xeriscaping," says John Young, station stormwater manager. The base has installed such native trees as river birch, redbud, red maple, and bald cypress, as well as ground covers such as perennial peanut and ground mimosa, and ornamental native bunchgrasses such as Muhly grass and purple lovegrass.

"The grasses are great," says Young, adding that "they are a viable alternative to shrubs on many sites. We use them in all our biofiltration areas as well, so we get double use out of them—as green infrastructure to clean the water, and as landscaping."

This project is a great example of the significant value of working collaboratively on projects such as these, where the benefits are wide ranging and long term.

–Dr. Ann Shortelle

Stormwater Program Manager John Young shows off the "rain garden" at NAS Jacksonville. The pink Muhley grass, lovegrass, and bald cypress in this biofiltration area provide treatment for stormwater while also beautifying the installation.

Miriam S. Gallet

Native plants, being adapted to regional rainfall patterns, require no irrigation, allowing the station to leave a lot of water in the ground–roughly half a million gallons per year for utility applications alone–helping the Navy achieve its water conservation and quality goals.

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Along the same lines, NAS Jacksonville is testing a "Sustainable Landscaping Initiative" which proposes to turn some marginal mowed areas over to meadows of native grasses, such as Andropogon or broom sedge.

"The Andropogons grow about four feet tall," says Young, "and form what looks like a wheat field, 'amber waves' and all." The station has field-tested broom sedge and a variety of other natives, all grown from seed, on five sites and is considering ways to reduce the 1,200 acres of grass currently mowed. Young notes that meadows, with their taller and deeper-rooted growth, would only require mowing once a year in late fall, after the plants had set seed, and would reduce runoff and improve water quality. Additional benefits would include support of pollinators.

A Community Project

Since its inception, the wastewater reuse project has eliminated the discharge of more than 315 million gallons a year of treated wastewater into the St. Johns River. At the same time, while it was being constructed, the system prevented the withdrawal of more than 44 million gallons of potable water from the Florida Aquifer.

The significant achievement was the direct result of NAS Jacksonville's long-term environmental partnerships with multiple players from state, city and civic organizations—all working together to improve the water quality of the St. Johns River. In the words of Dr. Ann Shortelle, St. Johns River Water Management District executive director, "This project is a great example of the significant value of working collaboratively on projects such as these, where the benefits are wide ranging and long term." ⚓

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